its predecessors, the present part is accompanied by a magnificent series of plates and analytical figures of the flowers and fruits of the various species, which very materially enhance the value of the memoir.

The genus Ceratolobus, which is confined to the Malay Peninsula, Sumatra, Java and Borneo, consists of six species, four of which are described by Beccari. Three of these four are found in Borneo and two in the Malay Peninsula—one of the later, *C. lævigatus*, Becc. having six varietal forms spread over the Malay Peninsula, Sumatra and Borneo. *Calospatha Scortechinii*, collected by that assiduous botanist, Father Scortechini, in Perak, and described by Beccari, comes next on the list and is an interesting and very distinct palm, having a homogeneous albumen in the seeds, two to three in a fruit. In the genus Plectocomia, which are large, spinous, calamoid palms with terminal inflorescences, six new species are described. One of these, *P. Kerrana*, was discovered at Doi Soetep, near Chiengmai, Siam, by Dr. Kerr, who has made known to us the riches of the Siamese flora by his admirable collections in that country.

Plectocomiopsis is a new genus described by Beccari, containing five species, from Lower Burma and throughout the Malay Peninsula and Sumatra, and is again a calamoid, diœcious genus allied to Myrialepis, Becc. In its vegetative organs it resembles Plectocomia, though it differs widely in the spadices and flowers. Beccari then passes to the genus Zalacca, a characteristic and exclusively Indo-Malayan group containing thirteen species, denizens of rich, deep and moist soil in the recesses of primæval forests. The home of *Z. edulis*, which is frequently cultivated for its edible acid fruits, is not definitely known, but it is considered to be a native of the Malay Islands. It has been known since the time of Clusius, who examined fruits of this palm sent over from Bali in brine about 1600. Two new varieties of this species are described, and six new species by Beccari; of the latter, *Z. dubia* is only certainly known from the male flowers.

The genus Pigafetta described by Beccari was regarded by Martius as a section of Metroxylon, the sago palm, but Beccari proves that it is a distinct genus by its polycarpic nature. It is not closely allied to any other genus of Lepidocaryeæ, and is a tall tree with diœcious, axillary spadices and small calamoid fruits. It is due to these small fruits, no doubt, which are eaten by birds, that this palm, *P. filaris*, has so wide a range in the Moluccas, Celebes, New Guinea and Indo-China.

The next genus dealt with, Korthalsia, is again a genus of climbing palms containing twenty-six species, mainly Malayan. They are of economic use as, being very tough, the naked canes are used for tying, etc., by the natives; they are also of interest in being myrmecophilous, with the appendage at the mouth of the leaf sheath (the ocrea) largely developed and sometimes transformed into a closed ant nidus. Extra-floral nectaries are also developed in the axillæ of the leaflets.

Metroxylon, the sago palm, and Eugeissona, one species of which, *E. utilis*, Becc., also yields a sago flour, complete the Asiatic Lepidocaryeæ, and the part is concluded with an enumeration of the extra Asiatic palms belonging to this family, among which Raphia and Mauritia are perhaps the best-known genera.

The genus Metroxylon contains six species with numerous varieties, and the account of these valuable palms occupies nearly forty pages of the memoir. They are arborescent palms with a terminal inflorescence, and the two best-known species are *M. Rumphii* and *M. Sagus*, which are widely cultivated in the Moluccas, for the sake of the starch or sago flour extracted from the stem. Both these palms yield many other commodities used by the natives. Prof. Beccari considers the Moluccas to be the home of these two species, and especially the island of Ceram, where a new species, *M. squarrosum*, Becc., has been found in abundance at the east end. Owing to their importance in affording food to the natives, they have now been carried far and wide.

To appreciate the value of this work it must be studied in detail, and all students of palms and botanists generally will realise how much they have lost by the death of Prof. Beccari, who was the pre-eminent authority on palms. A. W. H.

The Control of Electric Power.

Switching Equipment for Power Control. By S. Q. Hayes. Pp. vii+463. (New York and London: McGraw-Hill Book Co., Inc., 1921.) 20*s*.

SOME of the most important problems with which the engineer of a large power station has to deal are in connexion with the switches and control apparatus of his distribution system. Information on this subject can be found in a very condensed form in several text-books, but there is a demand for more detailed information, and in particular there is a great demand for a definite statement of the physical principles on which many of these devices are supposed to act. In Mr. S. Q. Hayes' book detailed information is given of many types of switchgear of American manufacture, but as a rule the descriptions are similar to the descriptions we get in manufacturers' catalogues, and in some cases they are actually taken directly from these catalogues. The author is one of the leading experts on switchgear, and occasionally

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the reader is gratified by a brief description of the theory on which the device is founded, but in many cases no hint is given.

In our opinion the value of the book would be very greatly increased by additional brief descriptions of the physical laws which govern the action of many of the devices used by engineers. For example, a table of the rating factors by which the voltage of a given circuit breaker must be multiplied so as to get its rating at various heights above the sea level is given. It would be useful to give the theory used by the General Electric Company of America in getting these numbers.

Many types of the spark gaps used in practice are given, and it is pointed out that the sphere gap has a greater speed of discharge than the horn gap. The "impulse gap," which we believe was perfected during the war in connexion with the spark gap used in the magneto circuit of an aeroplane, is now adopted for lightning arresters. The Westinghouse Company state that it is more efficient than any other spark gap. An investigation of the action of the lightning arresters described would be a very promising field of research for the pure physicist.

In reading this book one gets accustomed to the American words "resistor" and "reactor" which are used for "resistance" and "reactance coil" respectively, and these words might well be adopted in this country. Electrical engineers talked about "omnibus bars" thirty years ago, it then became "bus bars," and now apparently it has become "busses." This book will be useful to the switchgear expert.

A. R.

A Modern Text-book of Chemistry.

Inorganic Chemistry. By Prof. T. M. Lowry. Pp. xi + 943. (London: Macmillan and Co., Ltd., 1922.) 28*s.* net.

FIFTY years ago there were no books on physical chemistry. The work which had been done on the borderline of physics and chemistry was scattered in different journals and was not readily accessible to the student. The first volume of Miller's "Chemistry," Tilden's "Chemical Philosophy," and certain articles of the old Watts's "Dictionary" were the first available summaries of what is now one of the most important branches of the subject. The works of Lothar Meyer and Ostwald, published in the late 'seventies of the last century, did much to direct attention to the importance of physical chemistry. The first professor of physical chemistry was appointed only twenty-five years ago, and even now this branch of the subject is still allotted to a lecturer at some of the universities in this country.

It is now recognised that inorganic and organic chemistry will become a mere record of facts, the interpretation of which, without the aid of physical chemistry, will remain undisclosed. It is therefore a matter of congratulation to the publishers that they should have been able to arrange for the publication of a book on inorganic chemistry by a physical chemist. The author is also to be congratulated on the way in which he has fulfilled his task. Perhaps the severest test of such a book is to refer to all the parts of the work which one knows are stumbling-blocks to the ordinary intelligent student. Prof. Lowry's book stands this test remarkably well; in one case alone, the liquefaction of gases, will the information need to be supplemented by the teacher. If it had been possible to give the references to original papers the book would have sufficed for any chemist who was not intending to devote himself to inorganic chemistry as his main subject, although the author in his preface seems to disclaim the use of his book as a book of reference.

The book is admirably produced, and the illustrations are remarkable, no less for their number than for their clearness. The book may be heartily recommended.

H. B. BAKER.

Our Bookshelf.

Drahtloser Übersee-Verkehr. Von Dr. Gustav Eichhorn. Pp. 69 + xx. (Zürich: Beer et Cie, 1921.) 7 francs.

IN the first two chapters of the publication under notice, an excellent description is given of the great German radio-station at Nauen and of the receiving station at Geltow, twenty miles south of it. The third chapter discusses the theory of thermionic tubes, and the method of indicating the paths of the various currents by marking them in different colours is to be commended. The last chapter on radio-telephony is concerned mainly with modern German practice. In the Appendix a few well-known papers by Howe, Vallauri, etc., are published. The book is clearly printed, and the photographs of the Nauen station and the great lattice towers with their networks of wires show on what a huge scale it is designed.

During the last few years the station has been practically redesigned. The standard system of transmission does not yet seem to have developed. For example, they are at present constructing seven new towers, each 210 metres high, to enable them to communicate with Argentina. Under favourable atmospheric conditions the Telefunken Co., who own the station, have maintained communication with Japan for several years, although the messages have to go overland across Europe and Asia. The antennæ can be separated into four separate sections, each of which can be attached to a separate transmitter. When weather conditions are adverse all the antennæ can be connected in parallel. They then have a joint capacity of 0·01 microfarad. The two largest sections are each

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